Long-term Solid Waste Initiatives

Consideration of Regional WTE Concept for Frederick & Carroll Counties

October 30, 2007

Presented by: Frederick County Division of Utilities and Solid Waste Management (DUSWM)

Long-term Solid Waste Initiatives

- Between 1995 and 2005, most of the jurisdictions in Maryland enjoyed unusually low cost for the transportation and disposal of municipal solid waste (MSW) in large, out of state mega-landfills.
- The situation began to change in 2004. Pennsylvania adopted a series of surcharges on landfills to stem the flow of out of state waste. As diesel fuel prices soared in 2005 and 2006, the cost of transportation became more expensive than the cost of disposal.

Background

Long-term Solid Waste Initiatives

- New York City began using landfill capacity in Pennsylvania and Virginia, and the increased demand quickly escalated the market price for disposal in these states.
- Vendors insisted on fuel cost adjustments in addition to the standard inflation cost adjustment as fuel prices increased.

Long-term Solid Waste Initiatives

- Not only did this increase the cost for long hauling waste, it also introduced uncertainty to the costs because, unlike the inflation rates, fuel costs can swing up or down by several dollars per ton from month to month.

Long-term Solid Waste Initiatives

- Frederick County currently pays $58.89/ton (October 2007) to Waste Management (Houston, Texas) for the transfer and disposal of solid waste.
- This amount is adjusted monthly for fuel cost and semi-annually for inflation.
- At this rate, the estimated annual payment to Waste Management, Inc. in FY 2008 will be almost $15 million.

Long-term Solid Waste Initiatives

- The long haul transfer of waste to other jurisdictions and reliance on other states' acceptance of these wastes is not considered a sustainable solution in the management of Frederick County's solid waste.

Long-term Solid Waste Initiatives

- In addition to the environmental considerations of out of state waste transfer, the long-term costs of this option may divert available funds from being used to expand the County's other waste management programs including, but not limited to, curbside residential recycling efforts, household hazardous waste collection programs and future non-residential recycling programs.

Long-term Solid Waste Initiatives

- The long haul waste transfer operation is subject to a number of uncertainties that will increase the cost and availability of this option. These include:
  - The transportation and disposal contracts include monthly fuel cost adjustments which can be unpredictable and can drastically increase the per ton waste disposal costs based on diesel fuel cost increases.
  - As Virginia landfills fill up, the greater travel distance to landfills in North Carolina, South Carolina and potentially Georgia will result in significant increases in waste transfer costs and vehicle emissions.
  - The environmental impact of transferring waste over long distances is adverse to reducing greenhouse gasses and conserving fossil fuel.

Long-term Solid Waste Initiatives

- In March 2005 the County, through its membership in the NMWDA secured the services of R.W. Beck to complete a comprehensive study on the County's waste management options. The scope of the report included but was not limited to the following elements:
  - Alternative recycling strategies for the County's consideration.
  - Estimates of current and future solid waste generation.
  - Development of projected operating results of the system for both a six-year period from 2005 through 2010 and a 20-year period 2011 through 2031.

Background

Long-term Solid Waste Initiatives

- Review alternative municipal solid waste management disposal strategies for that portion of the solid waste which is not recycled, including:
- Long haul out of the County
- Construction of a commercially demonstrated waste-to-energy facility.
- Construction and operation of an organics composting facility and a municipal solid waste composting facility.
- Identification of alternative strategies for the funding of solid waste management services.

Long-term Solid Waste Initiatives

- The BoCC decided to fully explore R.W. Beck's recommendations regarding the Waste to Energy disposal alternatives.
- On February 16, 2006 the BoCC adopted Resolution 06-05 Waste To Energy Disposal Facility, directing the DUSWM and the NMWDA to pursue full service Design Build Operate (DBO) proposals for a 900 TPD local and 1500 TPD regional WTE facility.

Long-term Solid Waste Initiatives

- To assist the NMWDA and the DUSWM with the development of the RFP and the evaluation of proposals, the BoCC approved a contract with HDR Engineers on August 15, 2007.
  - Ramboll, Denmark is an Engineering consultant to HDR, providing support in the review of the WTE proposals.

Long-term Solid Waste Initiatives

Evaluation Team

Michael Marschner	Frederick County
Michael Evans	Carroll County
Robin Davidov	NMWDA
Chris Skaggs	NMWDA
Bruce Howie	HDR Engineers
Jorgen Haukol	Ramboll, Denmark
Bettina Kamuk	Ramboll, Denmark

Long-term Solid Waste Initiatives

- **Technologies Qualified**
  - Thermoselect
  - VonRoll
  - Martin
  - Consumat
  - Pioneer Plus (RDF)
  - Stabilat (MB)
  - Keppel Seghers
  - Steinmuller
  - Eco-Plus*

*Eco-Plus was qualified to provide fats, oils and grease recycling in conjunction with a WTE project.

Long-term Solid Waste Initiatives

- Technologies Not Qualified
  - AirReal Grate (Barlow)
  - Recovery Energy

Long-term Solid Waste Initiatives

- In accordance with the BoCC's resolution the DUSWM and the NMWDA pre-qualified full service WTE providers and in August 2006 issued a Request For Proposals (RFP) for the WTE project.

Consideration of Waste To Energy

The Evaluation Committee felt that it was necessary to become well informed on the most recent technology available. Therefore, in March of this year, the Evaluation Committee and Commissioner David Gray visited seven European countries to meet with European waste management authorities.

Consideration of Waste To Energy

- The tour also included several waste disposal systems, including four mass-burn WTE facilities, a mechanical biological processing facility, recycling processing facilities and a large automated organic composting facility.

Isseanne WTE Under Construction in Paris

- The group also toured a new 1500 TPD WTE, which is being constructed in Paris, France along the River Seine, approximately 1½ miles from the Eiffel Tower.

Isseanne WTE Under Construction in Paris

New ultra modern 1500 TPD WTE facility under construction along the River Seine

This brand new WTE facility in Paris is about a mile and half from the Eiffel Tower.

Consideration of Waste To Energy

HVC Groep wte facility in Holland

Waste To Energy Alternative

- Although there have been many expansions of US WTE facilities, it has been more than 10 years since a brand new WTE facility project has been developed in the US.
- The European technology tour allowed the County and NMWDA staff to review the latest in WTE technology.

Consideration of Waste To Energy

- The tour also provided staff with the opportunity to meet with several major European Waste Management Associations
- Staff also visited several WTE facilities, where major facility expansions and new facilities are being constructed.
- This allowed NMWDA and DUSWM staff to directly compare current European WTE disposal technology to recent past US practice.

RDF Processing Facility at Herhoff in Rennerod Germany

Consideration of Waste To Energy

Mass Burn WTE Facility, ASM Brescia
Brescia, Italy

- County Commissioner David Gray also participated in the Technology Tour, ensuring that both the County's technical and political staff are in the best position to review and understand the full service WTE proposals submitted to the County.
- All seven of the Countries visited take an integrated approach to waste management, relying heavily on recycling and energy recovery through thermal treatment (WTE).

Consideration of Waste To Energy

- Summary of European Study Tour Findings
  - Thermal treatment was reported by all of the Country representatives to be the most reliable technology over the past 40 years.
  - The predominate thermal treatment technology is mass burn.

Consideration of Waste To Energy

- WTE technology has continued to evolve over the past 10 years in Europe. Some of the improvements are applicable to the U.S., while others are not. Specifically:
  - European facilities process both the bottom and fly ash so that more of the residue is recyclable as products, such as road aggregate.
  - Fly ash is used to reclaim salt mines in Germany; this is not applicable in the U.S.
  - Wet scrubbers provide additional air pollution control, but many plants reported problems in disposing of the scrubber residue, and new plants in Europe typically do not include this technology.

Consideration of Waste To Energy

- Many of the WTE facilities in Europe generate thermal energy (steam or high temperature hot water) in addition to electricity. The energy output affects the designs of the boilers, economizers and superheaters. These combined heat and power facilities can recover even greater energy from the waste, but rely upon extensive district heating pipe networks.

Consideration of Waste To Energy

- European facilities burn wood and yard debris to maximize energy production. This is not a common practice in the U.S., and the WTE facilities are generally not designed for the combustion of large quantities of high heat value wood waste. A small quantity of high heat value waste will not adversely affect the U.S. WTE facilities.

Consideration of Waste To Energy

- Architectural considerations are very important in Europe. In Paris, for example, a group of local residents and business leaders helped choose the building design.
- The European Union has taken significant steps to reduce greenhouse gas emissions by banning organic wastes from entering landfills.

Consideration of Waste To Energy

- Biosolids (wastewater treatment plant sludges) are co-fired with MSW in some WTE facilities in Europe, and increase the energy output of the facility.
- Composting yard waste is a useful and successful method of managing this waste stream.
- Sorting, processing and marketing construction and demolition waste is an efficient method of managing this waste stream.

Consideration of Regional WTE Concept

- An integrated waste system in Europe is typically 45% recycling, 45% combustion for energy and 10% landfilling.
- Facilities in Europe typically underwent major upgrades and refurbishments after 30 years of operations.
- The facility should be designed to accommodate tour groups, including school children.
- Regional projects, with multiple jurisdictions participating, result in the most economical project with greatest energy recovery.

Consideration of Regional WTE Concept

- The detailed proposals were received on April 20, 2007.
- The evaluation of the WTE proposals is complete and the results show that the regional concept will provide Frederick County with the lowest cost waste disposal.

Consideration of Regional WTE Concept

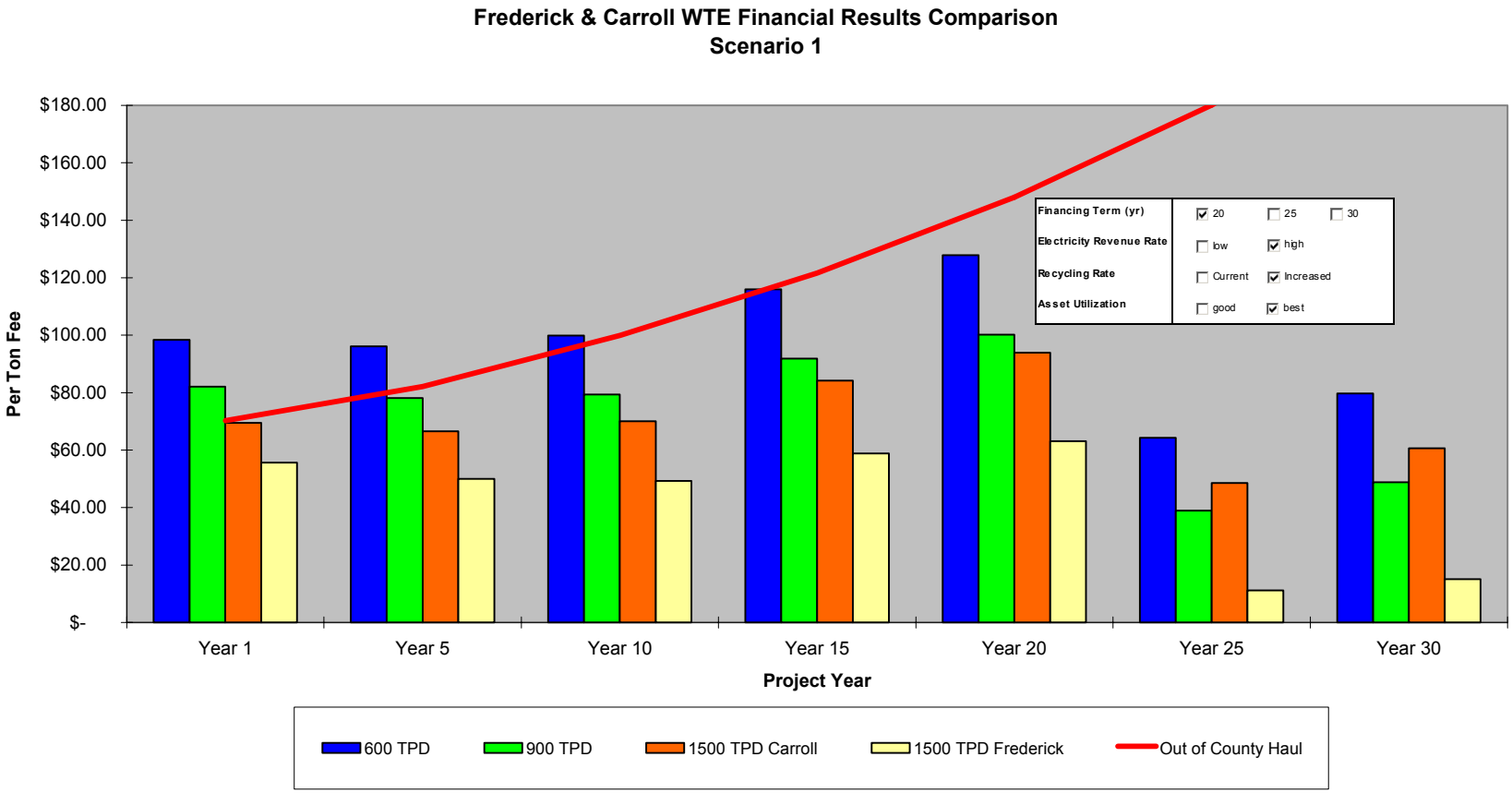
- A financial model was developed so the various scenarios could be evaluated to identify per ton disposal costs based on the following considerations:
  - Financing Term
  - Electricity Revenue Rate
  - Recycling Rate
  - Asset Utilization

Consideration of Regional WTE Concept

- Under Scenario 1, the per ton disposal rate for both Frederick and Carroll Counties, based on a 1,500 TPD regional facility is below the projected costs to use long haul out of County waste disposal.

Scenario 1

Consideration of Regional WTE Concept



Scenario 1

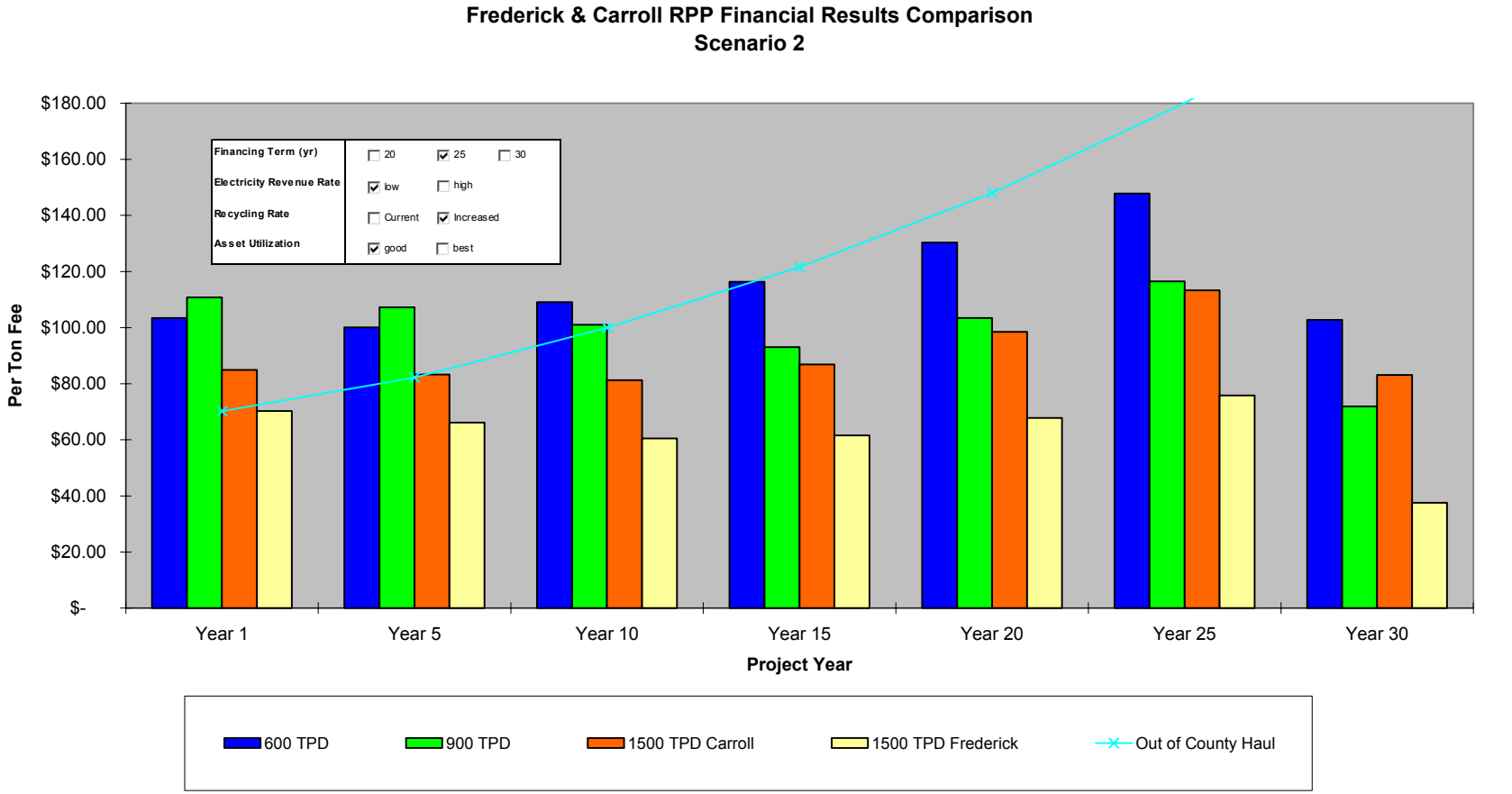
Consideration of Regional WTE Concept

- The per ton costs for separate 900 TPD (Frederick County) and 600 TPD (Carroll County) WTE facilities in each County are higher than the projected Year 1 (2012) long haul waste disposal option. However, by Year 5 (2017) the model predicts that Frederick County's per ton cost of the long haul option will exceed the per ton cost for disposal in a (Frederick) 900 TPD facility.

Consideration of Regional WTE Concept

- Under Scenario 2, the per ton disposal rate for Frederick County is below the projected costs to use long haul out of County waste disposal. However, Carroll County's cost per ton is higher until Year 5 (2017), at which point the per ton costs for long haul begin exceeding the WTE 1500 TPD regional option.

Consideration of Regional WTE Concept



Scenario 2

Consideration of Regional WTE Concept

- Based on the separate 900 (Frederick County) and 600 (Carroll County) WTE concept, the cost per ton for separate WTE facilities is higher than the long haul option until year 10 (2022) for Frederick County and Year 15 (2027) for Carroll County.

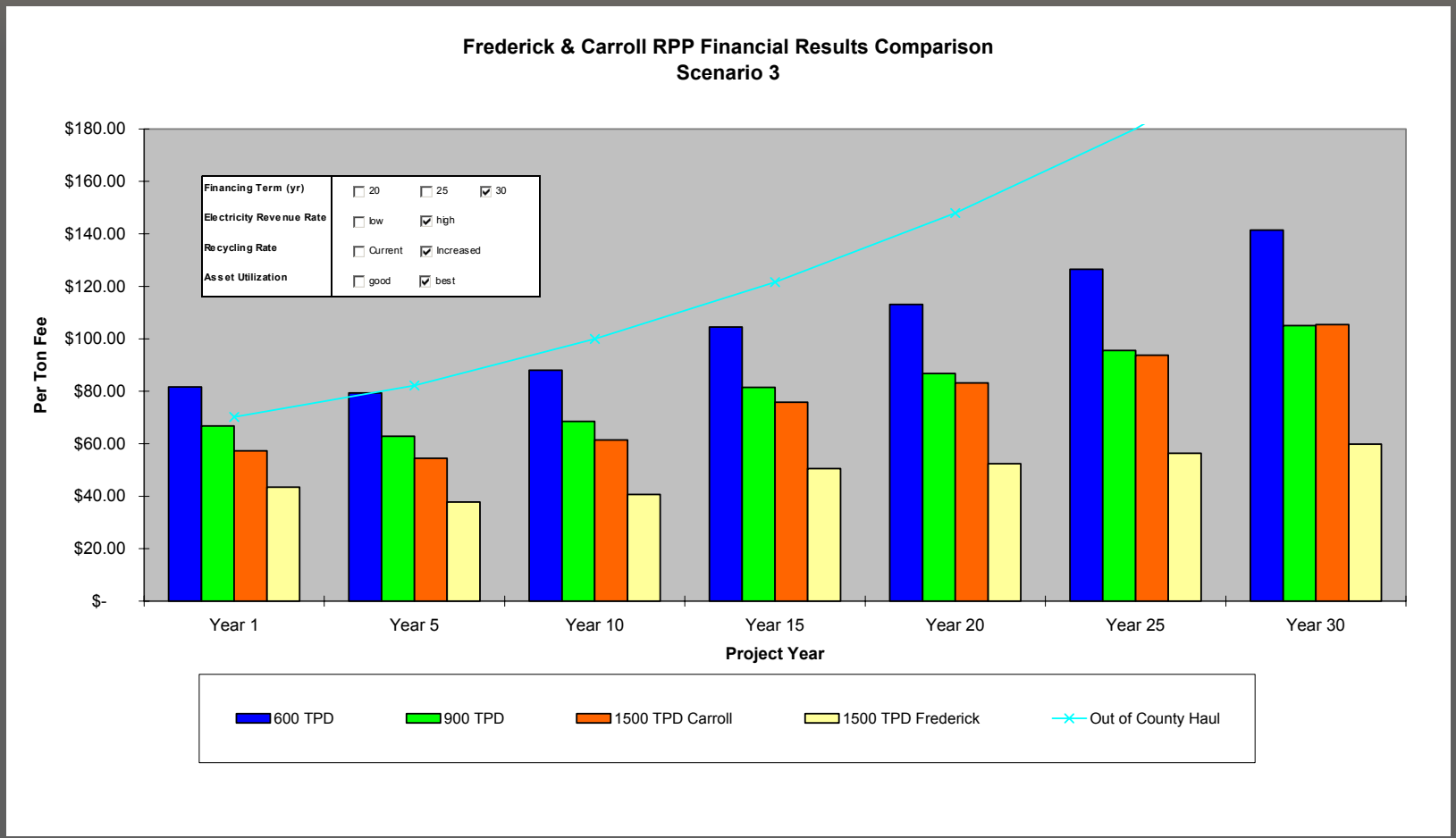
Scenario 2

Consideration of Regional WTE Concept

- Under Scenario 3, the per ton disposal rate for both Frederick County and Carroll County relying on a regional 1500 TPD is well below the projected costs to use long haul out of County waste disposal. In fact, based on these financing and operating conditions, the 900 TPD Frederick County only WTE, per ton cost, would be lower than its current (October 2007) cost for long haul disposal.

Scenario 3

Consideration of Regional WTE Concept



Scenario 3

Consideration of Regional WTE Concept

- Carroll County's cost per ton in Year 1 (2012), based on the Regional concept, would be at or below Frederick County's current long haul disposal cost. Based on the separate 900 (Frederick County) WTE concept, the cost per ton for a separate Frederick County WTE facility is also lower than the projected Year 1 long haul disposal cost per ton.

Scenario 3

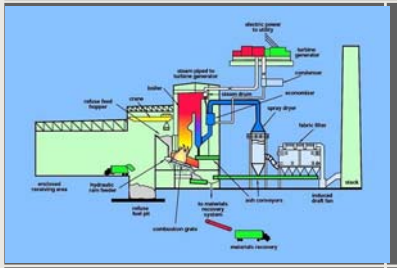
Consideration of Regional WTE Concept

- Based on the proposals received for a regional 1,500 TPD WTE project, construction cost would be approximately $323 million.
  - The Frederick County share of this regional project would be $194 million, which would be financed over 20, 25 or 30 years using Revenue Bonds.

Consideration of Regional WTE Concept

- These scenarios clearly show that a regional facility, which would serve Frederick and Carroll County, will result in the lowest per ton waste disposal cost through the life of the project. Therefore, the DUSWM and the NMWDA believe that the Regional concept should be considered ahead of the construction of separate facilities in each County.

Consideration of Regional WTE Concept

Potential Cost Savings (WTE Verses Transfer) Based on Scenario 2						
	Year 1	Year 5	Year 10	Year 15	Year 20	Year 25
Annual Tons (Thousands)	230	247	274	302	306	306
Cost Savings* (Millions)	$3.4	$8.0	$13.9	$19.0	$19.2	$51.6

* Based on today's value.

Consideration of Regional WTE Concept

- Since the Authority did not receive a proposal for a 1500 TPD regional facility in Carroll County, Frederick County needs to first decide if it is interested in pursing the regional 1500 TPD WTE facility which would be located in Frederick County and, if so, the Carroll County Commissioners will need to decide if they are prepared to participate in a regional project.

Consideration of Regional WTE Concept

- If both Counties decide that they want to jointly pursue a regional WTE, we would direct the NMWDA to finalize the procurement process by seeking best and final proposals from Covanta and Wheelabrator, which would be presented to the respective Boards for their final consideration of the regional WTE project.

Consideration of Regional WTE Concept

- If the Frederick and Carroll County Commissioners choose to pursue the Regional WTE.
  - They would execute a Memorandum of Understanding with the Authority to authorize final negotiations with one or both Vendors, and direct the Staff to bring a draft Contract Service Agreement between the selected vendor and the Authority and a mirror Energy Recovery Agreement among the Authority and the Counties.

Consideration of Regional WTE Concept

- The Energy Recovery Agreement would address, among other things, the following:
  - The design, construction and operation of a 1500 TPD Energy Recovery Facility (WTE)
  - Frederick County and Carroll County will direct the Authority on the project scope, budget, use, and performance.

Consideration of Regional WTE Concept

- Frederick County residents shall earn a Renewable Energy Benefit in respect of hosting the Facility. The amount of the REB shall be 5% of the net electricity sales for each year. The amount of the REB shall be paid by the Authority to the County's Waste Enterprise Fund each year. The REB is estimated to be $840,000 in 2012.
- Net energy generated by the WTE shall be offered for sale to the County, or a buyer's group in which the County participates, prior to being sold to other buyers.

Consideration of Regional WTE Concept

- The Authority, with Frederick County's approval, shall optimize the energy recovery rates and the REB by sub-contracting excess waste capacity to another Authority member.
- The County will not issue general obligation bonds for this project. The Authority shall finance the WTE with tax-exempt and taxable revenue bonds.
- The County shall amend the Ten Year Solid Waste Plan to include the WTE concept.

Consideration of Regional WTE Concept

- The DUSWM believes that the regional concept provides the lowest per ton cost for the disposal of Frederick County's solid waste.
  - Frederick County's first year cost of the WTE facility operation, assuming 20 year financing, conservative energy prices and asset optimization is $1 million less/year than the County is currently paying, and $2.68 million less/year than the projected cost of out of County hauling and landfill disposal.

Consideration of Regional WTE Concept

- Sharing the cost of a regional facility's construction and operation decreases the cost of the overall project and through the provision of a Renewable Energy Benefit concept generates an additional funding source which could be rebated to Frederick County residents to help offset future increases in electrical cost that they will likely incur as all energy costs increase.

Consideration of Regional WTE Concept

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Consideration of Regional WTE Concept

- The DUSWM recommends that the BoCC authorize the NMWDA to obtain best and final proposals from both Proposers and complete a Service Agreement with the preferred Proposer, based on a regional 1500 TPD Frederick County Regional Facility, subject to Carroll County's decision to participate in a regional facility with Frederick County.

Recommendation